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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/611,733	07/07/2000	Timothy M. Schmidl	TI-30650	6869

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EXAMINER

NGUYEN, ALAN V

ART UNIT	PAPER NUMBER
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2662

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/611,733

Applicant(s)

SCHMIDL ET AL.

Examiner

Alan Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claim 1 rejected under 35 U.S.C. 102(a) as being anticipated by Andersson et al (US 5,937,002), herein Andersson.

Regarding claim 1, Andersson discloses a method to optimize the use of available channels in a base station with regard to connection quality of the connections between the base station and the mobile stations within the base station's range through a predetermined channel hopping sequence, column 10 lines 5-7 (wireless communication link between a first and second device using predetermined frequency hopping pattern). Andersson further states where a number of the best channels with regard to channel quality parameter are used. On column 4, lines 14-17 Andersson discloses a method that determines on predetermined channels a channel quality parameter, such as interference, for the connections. Andersson further discloses the channel quality parameter may also be obtained by measuring bit error rate (obtaining information indicative of communication quality). Andersson uses a slow associated control channel (SACCH) to transfer the hop sequences lists from the base station to the mobile station as explained on column 7, lines 4-11, with the SACCH being transmitted by a frequency included in the hopping pattern (selecting a hopping pattern

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a frequency on which to transmit a selected communication from first device to second device at a time when the selected frequency is specified by the hopping pattern for a transmission.

In regards to claim 2, Andersson further discloses the use of the SACCH as a channel to transmit hop sequences lists that is in a channel included in the hopping pattern as shown in column 7, lines 4-11.

In regards to claim 3, Andersson further discloses in figure 2 the hop sequences lists (elements 204-206) being transmitted through the SACCH. The figure clearly shows the SACCH being unidirectional. Therefore the frequency used to obtain communication quality and the SACCH are on different channels.

In regards to claim 5, Andersson further discloses the use of channel hopping from a base station to multiple mobile stations on column 3, lines 57-61.

In regards to claims 8 and 12-15, Andersson further discloses another embodiment where interference of the downlink channels are determined by the mobile stations as shown in figure 4, elements 208-210 and column 11, lines 10-16. As shown in figure 3 element 217 the mobile station measures and calculates the interference of the downlink channels, outputs the values as the channel quality parameters I1, I2... for respective channels ch1, ch2... and is received by the base station. Each of these channels is part of the channel hopping pattern. This rejects claim 8 since communication quality is provided by a plurality of frequencies of the frequency hopping pattern. This also rejects claims 12-15 since further communications in the form of

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quality information is sent from the mobile station to the base station in response to data quality.

In regards to claim 9, Andersson discloses the basic method of frequency hopping with regards to timing on column 7, lines 10-17. Andersson states that the base station and the mobile stations then know through the medium of the channel hop sequences on which channel transmission and reception shall take place in each time interval. It is inherently understood by one skilled in the art that two devices communicating with each other through frequency hopping must be synchronized with each other.

In regards to claim 10 and 11, Andersson further discloses the basic method of frequency hopping with regards to timing on column 5, lines 48-54. The base station transmitter transmits on channel 1 in a first time interval $t=0$, on channel 2 in a second time interval $t=1$, and on channel 3 in a third time interval $t=2$, these three channels being said to form a channel hop sequence for transmission from the base station to mobile station 1.

In regards to claim 16, Andersson further discloses a channel allocation device that is able to create new channel hop sequences continuously, where the new sequence can replace the old sequence, when the disparity in call quality or interference exceeds a predetermined level value, as disclosed on column 13, lines 23-31.

In regards to claim 19, Andersson further discloses a channel allocation means, shown in figure 3, element 211. The channel allocation means includes a device (212)

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for generating a signal attenuation parameter, a connection list (213) that contains input data for the algorithm used in allocating channels to the hop sequence lists, a sorted connection list (215) that has signal attenuation parameters arranged in sequence. The channel allocation means also has a device (216) for generating channel quality parameter based on interference, and this information is used to make a sorted channel list (219) based on channel quality parameters. The lists 215 and 219 are connected to a hop sequence generator (220) that uses these two lists to devise a hopping pattern. This pattern is transmitted through the SAACH and to the mobile station.

In regards to claim 20, Andersson further discloses the use of the SACCH as a channel to transmit hop sequences lists that is in a channel included in the hopping pattern as shown in column 7, lines 4-11.

In regards to claim 21, Andersson further discloses in figure 2 the hop sequences lists (elements 204-206) being transmitted through the SACCH. The figure clearly shows the SACCH being unidirectional. Therefore the frequency used to obtain communication quality and the SACCH are on different channels.

In regards to claim 22, Andersson further discloses the use of channel hopping from a base station to a mobile station other than the second station on column 3, lines 57-61.

In regards to claim 25, in addition to the features recited in claim 19 (see rationale above) Andersson further shows in figure 4 the use of a wireless system comprising of a base station and mobile station that both utilize frequency hopping. Figure 4 also shows the mobile station having a wireless interface to the base station.

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The mobile station has the capabilities of relaying to the base station quality information of the downlink transmission, as disclosed on column 11, lines 5-20. It is therefore understood that the mobile station must have a means of receiving communication quality and selecting a frequency hopping pattern.

In regards to claim 26, Andersson discloses in column 11, lines 5-15 and column 13, lines 39-50 the use of updating the channel hop sequences of both the base station and mobile station. Since the base station can update hopping sequences. The base station receives quality parameter information from the mobile station and creates an updated hopping sequence list based on the same quality parameter information.

In regards to claim 27, in addition to the features recited in claim 25 (see rationale above) Andersson further discloses the use of updating the channel hop sequences by a monitoring procedure disclosed in column 13, lines 23-35. The interference level must exceed a predetermined value, or threshold.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al (US 5,937,002) in view of Chang et al (US 6,501,785), herein Chang.

- (a) Andersson discloses a channel allocation device that is able to create new channel hop sequences continuously, where the new sequence can replace the old sequence, when the disparity in call quality or interference exceeds a predetermined level value.
- (b) Andersson fails to disclose a method that continuously compares possible frequency hopping patterns against currently assigned patterns regardless of the quality going below a threshold or not. Andersson's arrangement does not utilize full updating.
- (c) Chang teaches a method that utilizes a possible frequency hopping pattern that corresponds to a maximum possible estimated system performance is compared against a current estimated system performance corresponding to the current frequency hopping pattern as shown in column 1, lines 54-63. If the current estimated system performance is less than the maximum possible estimated system performance, then the frequency hopping pattern of the particular link is changed to the possible frequency hopping pattern.
- (d) It would have been obvious to one having ordinary skill in the art at the time the invention was made for Andersson's arrangement to utilize full updating by continuously comparing possible frequency hopping patterns against current hopping patterns to improve overall transmission quality and performance as taught by Chang.

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5. Claims 6, 7, 17, 18, 23, 24, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al (US 5,937,002).

- (a) Andersson discloses in figure 2 the hop sequences lists (elements 204-206) being transmitted through the SACCH. The figure shows the SACCH being unidirectional. Therefore the frequency used to obtain communication quality and the SACCH are on different channels.
- (b) Andersson fails to utilize the SACCH and communication quality frequency in the same channel. Andersson also does not disclose the implementation of the channel hopping method to Bluetooth ACL and SCO.
- (c) Andersson teaches in column 10, lines 61-67, and column 11, lines 1-18 another embodiment which monitors the interference data of the downlink transmission by the mobile stations. Figure 4 shows the SACCH being bi-directional. The mobile stations then also use the SACCH to relay interference information back to the base station. Thus, the frequency hopping lists and quality information are relayed through the same frequency.
- (d) It would have been obvious to one having ordinary skill in the art at the time the invention was made for Andersson's arrangement to use the frequency hopping lists and quality information through the same frequency. This gives Andersson's arrangement more options and broader functions. It would also have been obvious to one having ordinary skill in the art at the time the invention was made for Andersson to utilize their frequency hopping scheme in a Bluetooth ACL and SCO communication link. Bluetooth uses a frequency

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hopping method, and the implementation of Andersson's scheme would increase performance with regard to quality of transmission.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to frequency hopping and transmission quality assessment:

Ugland et al (US 5,581,548)

Bantz et al (US 5,394,433)

Hakkinen et al (US 6,567,459)

Koivu (US 5,737,359)

Sarkioja et al (US 5,774,808)

Kostic et al (US 6,549,784)

Kang et al (JP 2002252616A)

Kostic et al (IEEE article)

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Nguyen whose telephone number is 703-305-0369. The examiner can normally be reached on 8am-5pm ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 703-305-4744. The fax phone numbers


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for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

an

August 25, 2003



HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
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